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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/815,453	03/31/2004	Ricardo E. Gonzalez	PA2718US	7783

22830 7590 09/28/2010

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EXAMINER	
MCLEOD, MARSHALL M	
ART UNIT	PAPER NUMBER
2457	

MAIL DATE	DELIVERY MODE
09/28/2010	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/815,453	GONZALEZ ET AL.	
	Examiner	Art Unit	
	MARSHALL MCLEOD	2457	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 August 2010*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26 and 81-89* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-26 and 81-89* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. Claims 1-26, and 81-89 are pending in this application.

Response to Arguments

2. Applicant's arguments with respect to claims 1, 14 and their respective dependent claims have been considered but are moot as the examiner no longer relies on the teachings of Chuprun.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. **Claims 1-6, 8-10, 12-19, 21-23, 25-26, and 81-89 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld et al. (Patent No US 5,828,835), hereinafter Isfeld, in view of Hagsand et al. (Patent No US 7,254,142 B2), hereinafter Hagsand and further in view of Irwin (Patent No US 6,393,026 B1).**

5. With respect to claim 1, Isfeld discloses accepting the channel for unidirectional data transmission in the destination processing node (Column 3, lines 1-4); allocating a transmit buffer for the channel in the source processing node (Column 4, lines 29-35;

i.e. messages to be transmitted on the connectionless communication link can be interpreted as allocating a transmit buffer for the channel); allocating a receive buffer for the channel in the destination processing node (Column 4, lines 11-17); writing data from a source processing element to the transmit buffer (Column 3, lines 40-48); transmitting the data unidirectionally from the transmit buffer over the channel using a source network interface in the source processing node (Column 2, lines 40-45); receiving the data over the channel into the receive buffer using a destination network interface in the destination processing node (Column 4, lines 11-17); reading in the data from the receive buffer into the destination processing element (Column 4, lines 11-17).

Isfeld does not disclose a method of communicating data between a plurality of processing nodes, the method comprising: determining a route for a unidirectional channel from a source processing node in an array of processing nodes having locations to a destination processing node in the array of processing nodes, wherein the location of the source processing relative to the location of the destination node is fixed during data transmission, determined route based on a physical description of the array of processing nodes; generating the unidirectional channel along the determined route from the source processing node to the destination processing node, the channel having a bandwidth requirement.

However, Hagsand discloses the channel having a bandwidth requirement (Column 3, lines 42-43).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Isfeld with the teachings of Hagsand in order to speed up or reduce the transfer of data by specifying that the system bandwidth meet certain requirements.

The combination of Isfeld and Hagsand does not disclose a method of communicating data between a plurality of processing nodes, the method comprising: determining a route for a unidirectional channel from a source processing node in an array of processing nodes having locations to a destination processing node in the array of processing nodes, wherein the location of the source processing relative to the location of the destination node is fixed during data transmission, determined route based on a physical description of the array of processing nodes; generating the unidirectional channel along the determined route from the source processing node to the destination processing node.

However, Irwin discloses a method of communicating data between a plurality of processing nodes, the method comprising: determining a route for a unidirectional channel from a source processing node in an array of processing nodes having locations to a destination processing node in the array of processing nodes, wherein the location of the source processing relative to the location of the destination node is fixed during data transmission, determined route based on a physical description of the array

of processing nodes (Column 5, lines 35-45; the examiner states to applicant's that in ring topology the destination and source nodes are always fixed); generating the unidirectional channel along the determined route from the source processing node to the destination processing node (Column 8, lines 20-36).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the combined teachings of Isfeld and Hagsand with the teachings of Irwin, in order to the best processor utilization (Irwin; Column 3, line 47).

6. With respect to claim 14, Isfeld discloses a source processing node (Column 37, Claim 1), allocate a transmit buffer for the unidirectional channel, and write data to the transmit buffer for the unidirectional channel (Column 12, lines 26-48), and a source network interface (Column 12, lines 11-18), configured to transmit the data unidirectionally from the transmit buffer of the source processing node over the unidirectional channel (Column 2, lines 40-45); and a destination processing node (Column 4, lines 11-17), a destination processing element configured to accept the unidirectional channel, allocate a receive buffer for the channel in the destination processing node, and receive the data from the receive buffer (Column 4, lines 11-17), a destination network interface (Column 8, lines 50-52) configured to receive the data into the receive buffer for the unidirectional channel (Column 4, lines 11-17).

Isfeld does not disclose wherein the source processing node's location in an array of processing nodes is fixed relative to the location of a destination processing node during data transmission; wherein the destination processing node's location in the array of processing nodes is fixed relative to the location of the source processing node during data transmission; the unidirectional channel having a bandwidth requirement and generated by the source processing element along a route, the route and the bandwidth requirement based on one or more tasks associated with the destination processing node, and the source processing node and destination processing node included within an array of processing nodes.

However, Hagsand discloses a channel that has bandwidth requirement (Column 3, lines 42-43).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Isfeld with the teachings of Hagsand in order to speed up or reduce the transfer of data by specifying that the system bandwidth meet certain requirements.

The combination of Isfeld and Hagsand does not disclose generated by the source processing element along a route, the route and the bandwidth requirement based on one or more tasks associated with the destination processing node, and the source

processing node and destination processing node included within an array of processing nodes.

However, Irwin discloses wherein the source processing node's location in an array of processing nodes is fixed relative to the location of a destination processing node during data transmission (Column 5, lines 35-45; the examiner states to applicant's that in ring topology the destination and source nodes are always fixed); wherein the destination processing node's location in the array of processing nodes is fixed relative to the location of the source processing node during data transmission (Column 5, lines 35-45; the examiner states to applicant's that in ring topology the destination and source nodes are always fixed); generated by the source processing element along a route, the route and the bandwidth requirement based on one or more tasks associated with the destination processing node (Column 10, lines 3-16).

It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the combined teachings of Isfeld and Hagsand with the teachings of Irwin, in order to the best processor utilization (Irwin; Column 3, line 47).

7. With respect to claims 2 and 15, Isfeld discloses wherein the unidirectional channel is associated with a first task executing on the source processing element and a second task executing on the destination processing element (Column 12, lines 49-57).

8. With respect to claims 3 and 16, Isfeld discloses wherein the unidirectional channel is associated with a first port in the source processing element and a second port in the destination processing element (Column 41; Claim 41, lines 21-32).

9. With respect to claims 4 and 17, Isfeld discloses the size of buffers (Column 20, lines 12-18). Isfeld does not disclose wherein the unidirectional channel has a maximum number of buffers. However, Hagsand discloses wherein the unidirectional channel has a maximum number of buffers (Column 4, lines 17-24).

10. With respect to claims 5 and 18, Isfeld does not disclose reserving intermediate resources for the unidirectional channel based on the bandwidth requirements. However, Hagsand discloses reserving intermediate resources for the unidirectional channel based on the bandwidth requirements (Column 2, lines 63-67 and continued through to Column 3, lines 1-15).

11. With respect to claims 6 and 19, Isfeld does not disclose guaranteeing bandwidth based on the bandwidth 5 requirements using time division multiplexing. However, Hagsand discloses guaranteeing bandwidth based on the bandwidth requirements using time division multiplexing (Column 2, lines 38-44).

12. With respect to claims 8 and 21, Isfeld discloses polling a plurality of channels to check if data is received into the receive buffer for the unidirectional channel (Column 12, lines 44-50; i.e. ...hardware keeps state information which can be interpreted that the hardware checks if the channel has received data i.e. polling).

13. With respect to claims 9 and 22, Isfeld discloses freeing the transmit buffer (Column 34, lines 52-54).

14. With respect to claims 10 and 23, Isfeld discloses freeing the receive buffer (Column 38; Claim 11, line 36).

15. With respect to claims 12 and 25, Isfeld discloses receiving a pointer for the data in the receive buffer into the destination processing element and wherein receiving the data from the receive buffer is based on the pointer (Column 12, lines 40-48).

16. With respect to claims 13 and 26, Isfeld discloses wherein a time for a receive call in the destination processing element does not depend upon a size of the data (Column 2, line 40-50).

17. With respect to claim 81, neither Isfeld nor Hagsand discloses receiving the first task in the source processing node, wherein the step of generating a channel is performed in response to receiving the first task.

However, Irwin discloses receiving the first task in the source processing node, wherein the step of generating a channel is performed in response to receiving the first task (Column 10, lines 3-16).

18. With respect to claim 82, neither Isfeld nor Hagsand discloses determining a topology of processing nodes to process one or more tasks, the topology including the channel.

However, Irwin discloses determining a topology of processing nodes to process one or more tasks, the topology including the channel (Column 10, lines 3-16).

19. With respect to claim 83, Isfeld discloses receiving a response signal from the destination processing node by the source processing node (Column 9, lines 49-59).

20. With respect to claim 84, neither Isfeld nor Hagsand discloses assigning tasks to one or more nodes in the array of nodes, wherein said step of generating the unidirectional channel is performed in response to said step of assigning tasks.

However, Irwin discloses assigning tasks to one or more nodes in the array of nodes, wherein said step of generating the unidirectional channel is performed in response to said step of assigning tasks (Column 10, lines 3-16).

21. With respect to claim 85, neither Isfeld nor Hagsand discloses wherein the route for the unidirectional channel is further based on a physical description of the multi-processor system.

However, Irwin discloses wherein the route for the unidirectional channel is further generated based on a physical description of the multi-processor system (Column 10, lines 3-16).

22. With respect to claim 86, neither Isfeld nor Hagsand discloses wherein a compiler is configured to determine routing information for one or more channels and assign a task to one or more destination processing nodes.

However, Irwin discloses wherein a compiler is configured to determine routing information for one or more channels and assign a task to one or more destination processing nodes (Column 7, lines 20-39).

23. With respect to claim 87, neither Isfeld nor Hagsand discloses wherein the transmit buffer and receive buffer are allocated based on the one or more tasks and a physical description of a portion of the array of nodes over which the data is to be transmitted.

However, Irwin discloses wherein the transmit buffer and receive buffer are allocated based on the one or more tasks and a physical description of a portion of the array of nodes over which the data is to be transmitted (Column 8, lines 28-60).

24. With respect to claim 88, neither Isfeld nor Hagsand discloses wherein determining a route for a unidirectional channel is based on an application description.

However, Irwin discloses wherein determining a route for a unidirectional channel is based on an application description (Column 5, lines 35-58).

25. With respect to claim 89, neither Isfeld nor Hagsand discloses wherein generating the unidirectional channel along the determined route is based on an allocated communication bandwidth between a first task on the source processing node and a second task on the destination processing node.

However, Irwin discloses wherein generating the unidirectional channel along the determined route is based on an allocated communication bandwidth between a first task on the source processing node and a second task on the destination processing node (Column 10, lines 3-16).

26. **Claims 7 and 20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld, in view of Hagsand, in view of Irwin and further in view of Plante (Pub. No US 2004/0208602 A1).**

27. With respect to claims 7 and 20, Isfeld does not disclose guaranteeing bandwidth based on the bandwidth requirements using spatial division multiplexing. However, Plante discloses guaranteeing bandwidth based on the bandwidth requirements using spatial division multiplexing (Page 18; [0210], lines 1-8). It would have been obvious to a person having ordinary skill in the art at the time of the invention to modify the teachings of Isfeld with the teachings of Plante in order to transmit independent and separately encoded data signals using the current channel and specified bandwidth requirement put in place.

28. **Claims 11 and 24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Isfeld, in view of Hagsand, in view of Irwin and further in view of Pitts (Patent No US 6,505,241 B2).**

29. With respect to claims 11 and 24, Isfeld does not disclose destroying the unidirectional channel. However, Pitts discloses destroying the unidirectional channel (Column 30, line 32).

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MARSHALL MCLEOD whose telephone number is (571)270-3808. The examiner can normally be reached on Monday - Thursday 6:30 a.m-4:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Ario Etienne can be reached on (571) 272-4001. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Ramy M Osman/
Primary Examiner, Art Unit 2457

/Marshall McLeod/
Examiner, Art Unit 2457
9/15/2010